

Date: Monday, 10/22/2007 3:39:51 PM  
 User: Kim Johnston

## Process Sheet

50

Customer : CU-DAR001 Dart Helicopters Services Drawing Name : 350/355 AS X-TUBE FWD UNDER REVIEW  
 Job Number : 35274  
 Estimate Number : 12485  
 P.O. Number :  
 This Issue : 10/22/2007 S.O. No. :  
 Prsht Rev. : NC Part Number : D350748101  
 First Issue : 1 / Type : LANDING GEAR Drawing Number : UNDER REVIEW OK UP 10.10.27  
 Project Number : N/A  
 Drawing Revision : N/A  
 Material :  
 Due Date : 12/15/2007 Qty: 1 Um: Each  
 Written By :  
 Checked & Approved By : 10/07/10/23  
 Comment : Est Rev: A New Issue 06-07-05 JLM  
 Est Rev: B Update qty of MS21042L5 06-09-12 KJ

## Additional Product

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 DC DOCUMENT CONTROL



KS 07.12.11

Comment: Photocopy bluefile & type labels per PPPD350-748-101 CHG001 08/03/12

2.0 35274A X-TUBE AS 350/355 HI FWD UNDER REVIEW



Comment: Sub-Component X-TUBE AS 350/355 HI FWD  
 D350-748-141 B 35274A

3.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1  
 Pick Packing Kit

4.0 D35001 350 SADDLE



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  
 350 SADDLE  
 Batch: 1331934

5.0 D35011 BUSHING



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)  
 BUSHING  
 Batch: 1331935

EC 8/3/10 0

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Date: Monday, 10/22/2007 3:39:51 PM  
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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 350/355 AS X-TUBE FWD UNDER REVIEW

Job Number: 35274

Part Number: D350748101

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

AN46A

Bolt



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)

Bolt

Batch: M105810

7.0

AN441A

bolt



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

bolt

Batch: M105940

8.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Bolt

Batch: M105408

9.0

AN960JD416

Washer



Comment: Qty.: 32.0000 Each(s)/Unit Total : 32.0000 Each(s)

Washer

Batch: M106277

10.0

AN960JD516

Washer



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Washer

Batch: M106654

11.0

MS21042L4

Nut



Comment: Qty.: 24.0000 Each(s)/Unit Total : 24.0000 Each(s)

Nut

Batch: M105938

12.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Nut

Batch: M106277

10/3/10 (1)

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: AD Date: 08/03/14  
 QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Date: Monday, 10/22/2007 3:39:51 PM

User: Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 350/355 AS X-TUBE FWD UNDER REVIEW

Job Number: 35274

Part Number: D350748101

Job Number:



Seq. #:

Machine Or Operation:

Description :

13.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

CS 08/3/12 (1)

14.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D350-748-101

Location:

PPP Rev: B

CS 08/3/12 (1)

15.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

CS 08/3/12 (1)

Job Completion



CS 2008/3/13 (1)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 10/22/2007 3:39:58 PM  
User: Kim Johnston

## Process Sheet

50

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: X-TUBE AS 350/355 HI FWD UNDER REVIEW
Job Number	: 35274A		
Estimate Number	: 12484		
P.O. Number	:	Part Number	: D350748141
This Issue	: 10/22/2007 S.O. No. :	Drawing Number	: D350-748-141 <i>UR Rev.D 10.10.23</i>
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: 1 / Type : LANDING GEAR	Drawing Revision	: 8
Previous Run	: 35273A	Material	:
Written By	:	Due Date	: 12/15/2007 Qty: 1 Um: Each
Checked & Approved By	: <i>10.10.23</i>		
Comment	: Est Rev: A New Issue 06-07-05 JLM Est Rev: B Update cadplate process 06-09-12 KJ		

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	DC	DOCUMENT CONTROL
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Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D350-748-141 CHG001

*NA*

2.0	D6017115	Crosstube Material
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Comment: Qty.: 1.0000 Each(s)/Unit - Total : 1.0000 Each(s)

Crosstube Material

D6017-115

2.339" OD X 2.000" ID

Batch: *B27471**S.F 07/11/03*

3.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
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Comment: MORI SEIKI CNC LATHE LARGE

1-Fill tube with sand &amp; install plugs on both ends as per Folio FA648

2-Turn first side as per Folio FA648

3-Deburr &amp; Inspect for surface damage. Repair damage within limits as per Dwg D350-748-141.

*S.F 07/11/03*

4.0	QC1	INSPECT ALL DIM TO DIM SHEET
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Comment: INSPECT ALL DIM TO DIM SHEET

*S.F 07/11/03*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE AS 350/355 HI FWD UNDER REVIEW

Job Number: 35274A

Part Number: D350748141

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

1-Turn second side as per Folio FA648

2-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D350-748-141.

3-Scribe Part & Batch as per Dwg D350-748-141

8.F 07/11/03

6.0

QC1

INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

8.F 07/11/03

7.0

QC8

SECOND CHECK



Comment: SECOND CHECK

7.0 07.11.05

8.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

Remove all Machining Marks

JD 7-11-12

9.0

OUTSIDE SERV.10

OUTSIDE SERVICES -LG



Comment: Sub-Contracting OUTSIDE SERVICES

Issue P/O: 5031

C207/11/13

Heat Treat to min 180 KSI As per Dwg D350-748-141

(MIL-T-6736 OR AMS 2759-1C)

Sand Blast tube after Heat Treat

Possible Supplier: Vac Aero

Ensure Certificate of Conformity is attached

10.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Receive & Inspect For Transit Damage

Ensure certificate of conformaty is attached

2/12/11 50 (1x)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 10/22/2007 3:39:58 PM  
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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE AS 350/355 HI FWD UNDER REVIEW

Job Number: 35274A

Part Number: D350748141

Job Number:



Seq. #:

Machine Or Operation:

Description:

11.0

QC6

DIMENSIONAL CHECK



Comment: DIMENSIONAL CHECK

A 12/12 (X)

12.0

BENDING

BENDING MACHINE



Comment: BENDING MACHINE

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT EL 7-12-21

13.0

QC15

DIMENSIONAL CHECK OF X-TUBES



Comment: DIMENSIONAL CHECK OF X-TUBES

10-12-20 (D)

14.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B & C Drill Jigs,  
Set-up drill table as per QSI 010

2-Debur

3-Engrave Part # and Batch # as per Dwg D350-748-141

4-Remove all marks from tube within limits of D350-748-141

5- Apply a light coat of LPS3 on the interior of tube

Batch: \_\_\_\_\_

PTO  
SR 8-1-10  
SOL 8-01-11

15.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

CHECK 10 DEG HOLES WITH DT8876E(EUROCOPTER CLAMP)

ENGINEERING APPROVAL

08.01.22  
10/09/22 (X)

16.0

OUTSIDE SERV.10

OUTSIDE SERVICES -LG.



Comment: Sub-Contracting OUTSIDE SERVICES

Issue P/O: 5510

Stress relief at 375° for 5 hours

Magnetic Particle Inspect per ASTM E1444

Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2

Embrittle relief at 375° for 8 hours, Chromate Treat

Possible Supplier: Southwest United Industries

08/01/23 (D)

# Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D350-748-141 PAR #: N/A Fault Category: Prod / Landing Gear NCR: (Yes) No DQA: (D) Date: 08/03/14  
 QA: N/C Closed: (S) Date: 08/03/14

NCR: <u>35274 A</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07-12-28	14.0	cuff B is slightly higher by 0.100", than side A	<u>(Signature)</u> 08/01/12	from cuff "B" & even the height.	<u>SR</u> 8-1-10	<u>(Signature)</u> 08/01/12	<u>(Signature)</u> 08/01/12	<u>(Signature)</u> 07-12-28
08/01/12	# 15.1	During inspection it was found that the holes locations on the cuff were off alignment by a 0.040".	<u>UP</u> 08.01.21 per 08/01/12	Open holes in cuff with Q-DRILL, TEST ASSEMBLY ALL AFFECTED TUBES AND GET ENG APPROVAL	<u>EL</u> 8-1-12	<u>(Signature)</u> 08/01/12	<u>UP</u> 08.01.21 per 08/01/12	<u>(Signature)</u> 08/01/12
		R.C. Hummer error			<u>(Signature)</u> 08/01/12			

NOTE: Date & initial all entries

Date: Monday, 10/22/2007 3:39:58 PM  
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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE AS 350/355 HI FWD UNDER REVIEW

Job Number: 35274A

Part Number: D350748141

Job Number:



(Pto) →

Seq. #:

Machine Or Operation:

Description :

Ensure Certificate of Conformity is attached

17.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Receive & Inspect For Transit Damage

Ensure certificate of conformity is attached

18.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

19.0

SPRAY PAINTING

SPRAY-PAINTING



Comment: SPRAY PAINTING

1-Prime inside crosstube as per QSI 005 4.2

2-Prime Outside of Tube as per Dart QSI 005 4.2

20.0

QC14

INSPECT SPRAY PAINT



Comment: Inspect Spray Paint

Then, Wrap in plastic bag to protect from scratches

21.0

D35021

SUPPORT



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

SUPPORT

Batch: 32205

22.0

D2856400

Abrasion Strip



Comment: Qty.: 1.2401 f(s)/Unit Total : 1.2401 f(s)

Abrasion Strip 7.10" long x2

Batch: 35900

23.0

ALS41032225

Insert



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Insert

Batch: 100485

100489

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D350-748-141 PAR #: NA Fault Category: Pod/Landing Gear NCR: Yes No DQA: D Date: 08/03/14  
 QA: N/C Closed: KA Date: 08/03/14

NCR: <u>3574 A</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
08/01/14	15.	hole location is higher than 0.780" on Cupl R.C. Hammer error See NCR 08-012	CP 08.01.22 P 08/04/2	Grind <del>with</del> Base of call to determine the Dim of 0.780".	AWM 08-01-23	C 08/01/22	CP 08.01.22 P 08/04/2	S 08/01/21

NOTE: Date & initial all entries

Date: Monday, 10/22/2007 3:39:58 PM  
User: Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE AS 350/355 HI FWD UNDER REVIEW

Job Number: 35274A

Part Number: D350748141

Job Number:



Seq. #:

Machine Or Operation:

Description :

24.0

AN960JD10

Washer



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Washer

Batch: 105442 M 08 03 07

25.0

MS2192020

Clamp (per MIL-DTL-8783C)



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Clamp (per MIL-DTL-8783C)

Batch: 103478 M 08 03 07

26.0

MS27039110

Screw



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Screw

Batch: 18836 M 08 03 07

27.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install Ground wire Insert, then insert screw and washer

2-Install Abrasion strips as per Dwg D350-748-141 & QSI 035.

3-Install supports Using D18876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS

M 08 03 07

28.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

S 00/03/10 EC

29.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D350-748-241

Location:

PPP Rev:

PPP 35274

08/13/12 (1)

# Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



Date: Monday, 10/22/2007 3:39:58 PM

User: Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE AS 350/355 HI FWD UNDER REVIEW

Job Number: 35274A

Part Number: D350748141

Job Number:



Seq. #:

Machine Or Operation:

Description :

30.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Done 10/23/14 (1)

Job Completion



mi 2008/3/13

(1)

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b>	<b>35274A</b>
<b>Description:</b> Crosstube Assembly (AS350/355 High Fwd)		<b>Part Number:</b>	<b>D350-748-141</b>
<b>Inspection Dwg:</b> D350-748-141 <b>Rev:</b> <i>DD 07.10.27</i>		<b>Page 1 of 1</b>	

### FIRST ARTICLE INSPECTION CHECKLIST

☒ **First Article**
☐ **Prototype**

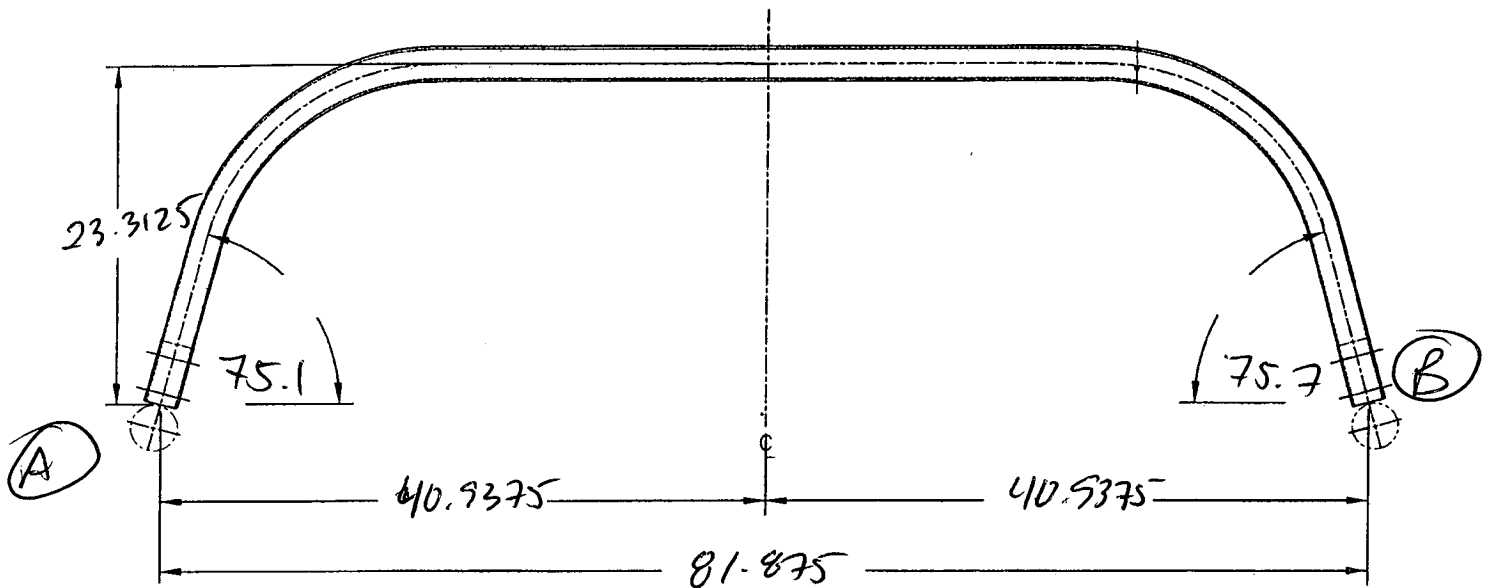
Inspection Sheet Drawing Dimension		Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.243	✓			
	2.180	+0.005/-0.000	2.184	✓			
	2.180	+0.005/-0.000	2.184	✓			
	2.237	+0.005/-0.000	2.239	✓			
	2.272	+0.005/-0.000	2.274	✓			
	2.306	+0.005/-0.000	2.306	✓			
	2.339	+0.005/-0.000	2.331	✓			
	2.339	+0.005/-0.000	2.339	✓			
	0.062	+/-0.010	.062	✓			
	4.26	+/-0.030	4.290	✓			
	R0.063	+/-0.010	.063	✓			
	R0.50	+/-0.030	.500	✓			
SIDE B	2.240	+0.005/-0.000	2.242	✓			
	2.180	+0.005/-0.000	2.183	✓			
	2.180	+0.005/-0.000	2.183	✓			
	2.237	+0.005/-0.000	2.239	✓			
	2.272	+0.005/-0.000	2.274	✓			
	2.306	+0.005/-0.000	2.308	✓			
	2.339	+0.005/-0.000	2.338	✓			
	2.339	+0.005/-0.000	2.338	✓			
	0.062	+/-0.010	.062	✓			
	4.26	+/-0.030	4.272	✓			
	R0.063	+/-0.010	.063	✓			
	R0.50	+/-0.030	.500	✓			
	110.27	+/-0.060					

<b>Measured by:</b> <i>S.F.</i>	<b>Audited by:</b> <i>[Signature]</i>	<b>Prototype Approval:</b>	N/A
<b>Date:</b> <i>07/11/03</i>	<b>Date:</b> <i>07-11-05</i>	<b>Date:</b>	N/A

Rev	Date	Change	Revised by	Approved
A	06.11.09	New Issue (P/O D350-748-101)	KJ/JLM <i>[Signature]</i>	<i>[Signature]</i>

DART AEROSPACE LTD		Work Order:	35274A
Description: Crosstube High Fwd (AS350/355)		Part Number:	D350-748-101
Inspection Dwg: D350-748-141 Rev: D		Page 1 of 1	

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
- Side B is slightly higher than A, by 0.100"
- Trim cutoff to even out height before drilling

QC15 Inspection	
Date	12.20

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	

**DART**

DESIGN <i>qp</i>	DRAWN BY <i>qp</i>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>HA</i>	APPROVED <i>HA</i>	DRAWING NO. D350-748-141	REV. D SHEET 1 OF 3
DATE 06.10.31		TITLE CROSSTUBE (AS 350/355 HI FWD) NTS	
A	06.03.31	NEW ISSUE	
B	06.06.30	ADD D6017-115 & PRIME AND PAINT	
C	06.08.14	ADD CAD PLATING	
D	06.10.31	MAG. PARTICLE AND CAD PLATE AS MFD.	

**RELEASED**06.10.31 *HA*

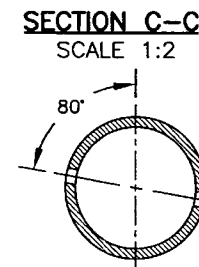
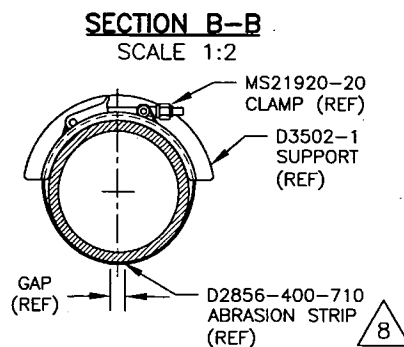
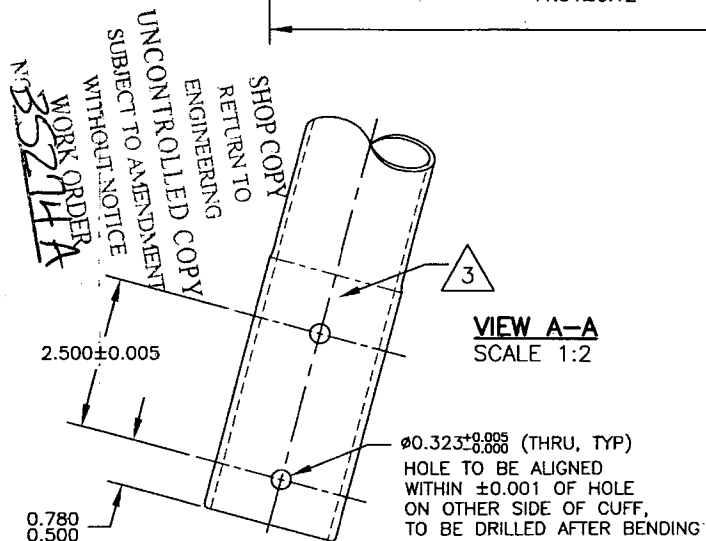
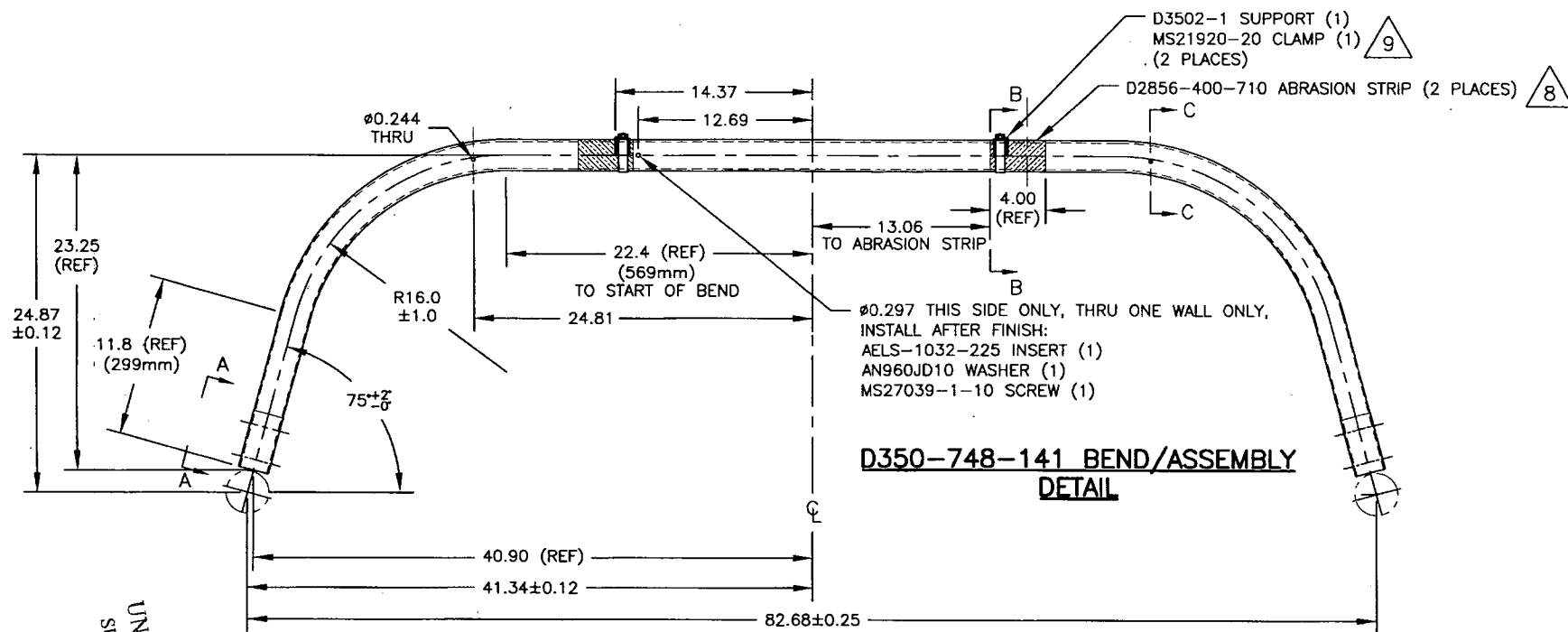
QTY	P/N	DESCRIPTION
X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
1	D6017-115	CROSSTUBE (OR D6015-125)
2	D3502-1	SUPPORT
2	D2856-400-710	ABRASION STRIP
1	AELS-1032-225	INSERT
1	AN960JD10	WASHER
2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
1	MS27039-1-10	SCREW

**D350-748-141 CROSSTUBE:**

- 1) MATERIAL: MANUFACTURED FROM D6017-115 OR D6015-125  
FINISHED LENGTH = 110.27±0.06
- 2) MACHINE PER MACHINING DETAIL ON PAGE 3. BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITIONS SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 3) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 4) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 5) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING.
- 6) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2  
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 7) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 8) INSTALL D2856-400-710 ABRASION STRIP WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 9) TORQUE MS21920-20 CLAMPS 60 TO 80 IN-LB
- 10) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 11) ALL DIMENSIONS ARE IN INCHES
- 12) PART IS SYMMETRIC ABOUT CENTERLINE EXCEPT FOR Ø0.297 HOLE.

**UNDER REVIEW!**07.02.16 *HA*CUT FOR REDUCED  
OK 07.07.22**Copyright © 2006 by DART AEROSPACE LTD**

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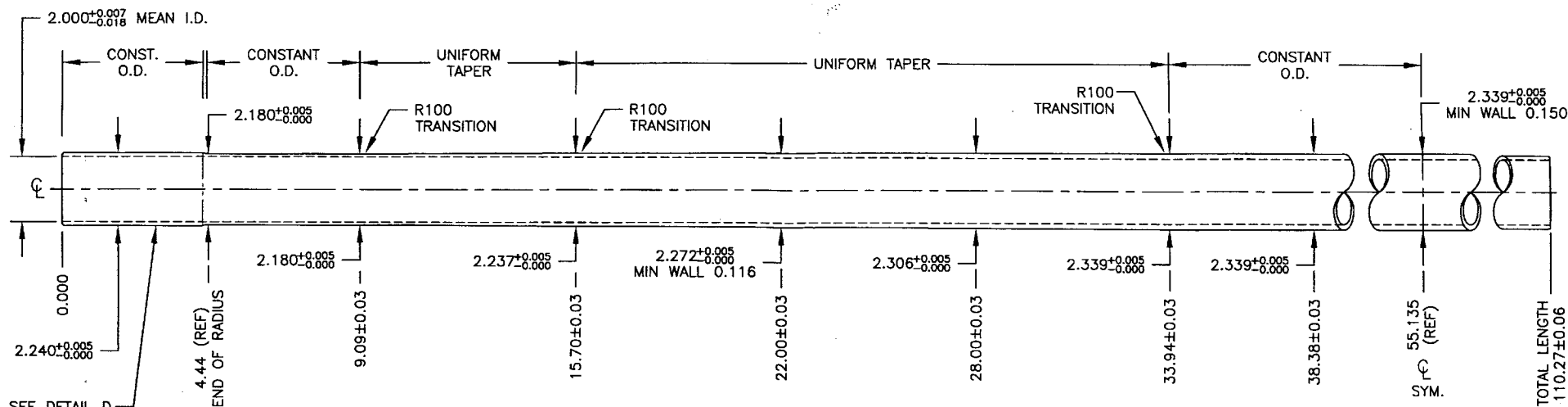
**UNDER REVIEW**  
07.02/16/11  
06.10.31

**RELEASED**  
06.10.31

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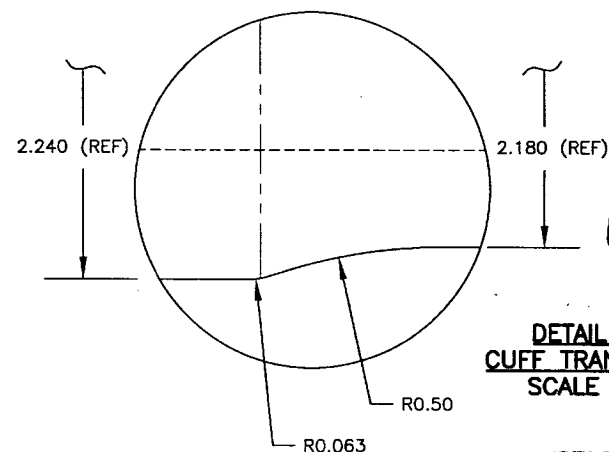
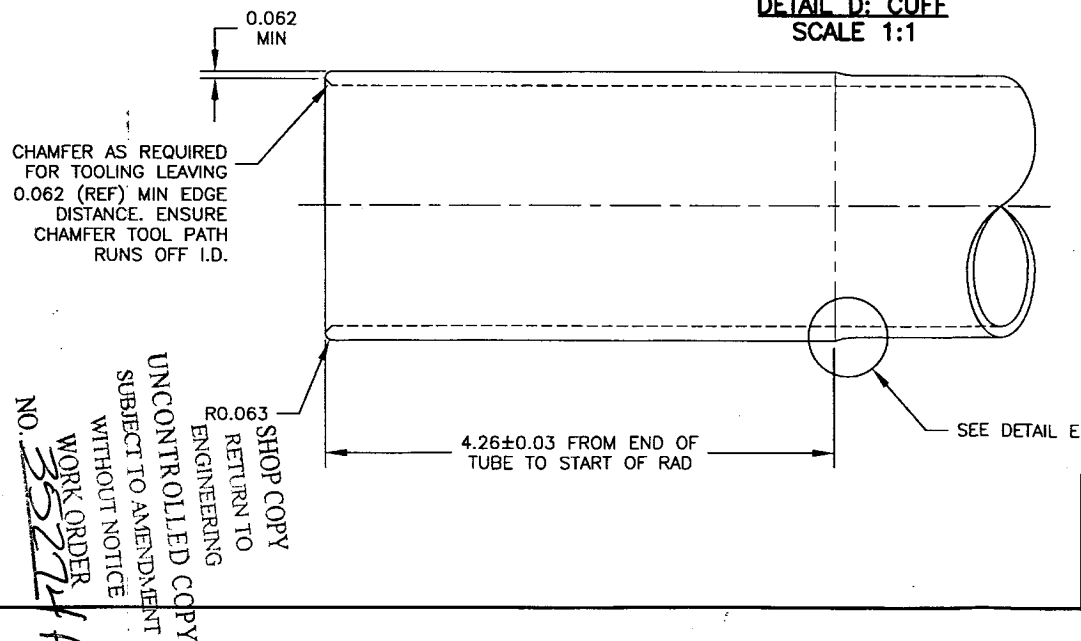
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DESIGN 90	DRAWN BY 90	<b>DART</b>	DART AEROSPACE LTD. WARRIMUR, ONTARIO, CANADA
CHECKED H	APPROVED H	DRAWING NO. D350-748-141	REV. D SHEET 2 OF 3
DATE 06.10.31	TITLE CROSSTUBE (AS 350/355 HI FWD)	SCALE 1:8	



### D350-748-141 MACHINING DETAIL

#### DETAIL D: CUFF SCALE 1:1



#### DETAIL E: CUFF TRANSITION SCALE 9:1

RELEASED  
06.10.31

UNDER REVIEW  
07.07/16/17  
CUFF TRANSITION  
OK (P.7.11.22)

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DESIGN QP	DRAWN BY QP	<b>DART</b>	DART AEROSPACE LTD. HAMMERSLEY, ONTARIO, CANADA
CHECKED #	APPROVED #	DRAWING NO. D350-748-141	REV. D SHEET 3 OF 3
DATE 06.10.31	TITLE CROSSTUBE (AS 350/355 HI FWD)	SCALE 1:3	



VAC AERO  
INTERNATIONAL INC.

# RELEASE NOTE

GST No.: R105468102

OAK 92999-1

☒ HEAD OFFICE  
1371 SPEERS ROAD, OAKVILLE, ONTARIO  
CANADA L6L 2X5  
TEL: (905) 827-4171 FAX: (905) 827-7489

☐ 2009 WYECROFT ROAD, UNIT B  
OAKVILLE, ONTARIO  
CANADA L6L 6J4  
TEL: (905) 827-7377 FAX: (905) 827-1380

☐ QUEBEC DIVISION  
7450 RUE VÉRITÉ STREET, ST. LAURENT, QUÉBEC  
CANADA H4S 1C5  
TEL: (514) 334-4240 FAX: (514) 334-6269

12/06/2007

MM/DD/YYYY

PAGE: 1

1DAR01

SKL TO: DART AEROSPACE LTD.  
1270 ABERDEEN ST.  
HAWKESBURY, ON

SHIP TO: DART AEROSPACE LTD.  
1270 ABERDEEN ST.  
HAWKESBURY, ON

K5A 1K7

K6A 1K7

DATE SHIPPED	SHIP VIA	F.O.B.
12/06/2007		ORIGIN
CUSTOMER P/O No.	JOB No.	TERMS
P000005031		COD

PART No.	DESCRIPTION	UOM	QTY ORD	QTY SHPD	TEST RESULTS
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D350-748

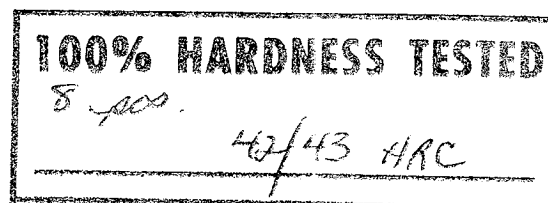
EA 8 8

Process Specifications: Procedure: 4353  
HEAT TREATED TO 180 KSI PER AMS 2759-1D  
100% HARDNESS TESTED AS PER ASTM E-18, HRC 40-45  
MATERIAL: 4130

ONE EACH OF:

D350-748-141B35272A, D350-748-141B35273A,  
D350-748-141B35274A, D350-748-141B35275A,  
D350-748-241B35276A, D350-748-241B35277A,  
D350-748-241B35278A, D350-748-241B35279A

NOTE: SAND BLAST TUBE AFTER HEAT TREAT



DR



I hereby certify that the material covered by this release note has been inspected and tested and conforms to all specifications relevant thereto in accordance with the conditions of the contract / or purchase order.

ON BEHALF OF VAC AERO INTERNATIONAL INC.

Authorized Q.C. Inspector



VACUUM BRAZING - HEAT TREATING - SPECIAL PROCESSING - FURNACE EQUIPMENT  
TURNING COMPONENT OVERHAUL PLASMA AND OTHER COATINGS



HEAT





**Chris Provencal**

---

**From:** David Shepherd [dshepherd@dartaero.com]  
**Sent:** January 21, 2008 5:20 PM  
**To:** 'Chris Provencal'  
**Cc:** 'Mike Petsche'  
**Subject:** RE: NCR D350-748-141/-241

Chris,

As per our discussions, your course of action as outlined below is acceptable to me.  
I agree ... an NCR must be raised to prevent this from happening in the future.

David

---

**From:** Chris Provencal [mailto:cprovencal@dartaero.com]  
**Sent:** Monday, January 21, 2008 2:36 PM  
**To:** 'David Shepherd'  
**Cc:** 'Mike Petsche'  
**Subject:** NCR D350-748-141/-241

David,

RE: The xtube cuff holes on several D350-748-141/-241 were misaligned by as much as 0.040". The misalignment is between the hole pattern on the inboard and outboard side of the cuffs, ie. The dimension from the bottom of the xtube to the center hole (0.500-0.780 on dwg) is different from inboard to outboard side.

We opened the holes on the worst-case xtube with a q-drill to 0.332 diam (dwg is p-drill or 0.323). The tubes could be assembled in a complete gear. He had to tap a few bolts through, but not nothing with any large amount of effort. We will assemble each affected tube and verify them.

The non-conforming xtube is the aft xtube in the attached picture. As this is an unusual deviation, we thought it best to ask for your opinion. Is this acceptable? An NCR has been initiated to figure out why this happened.

Thanks,  
-Chris

No virus found in this incoming message.  
Checked by AVG Free Edition.  
Version: 7.5.516 / Virus Database: 269.19.8/1235 - Release Date: 1/21/2008 9:39 AM

No virus found in this outgoing message.  
Checked by AVG Free Edition.  
Version: 7.5.516 / Virus Database: 269.19.8/1235 - Release Date: 1/21/2008 9:39 AM

**CERTIFICATE OF  
CONFORMANCE**

**CADORATH PLATING CO. LTD.  
2150 LOGAN AVENUE  
WINNIPEG, MANITOBA R2J-0J1**

**DATE: Feb-28-2008**

**CONSIGNED TO: Dart Aerospace Ltd.  
1270 Aberdeen St.  
Hawksbury, ON K6A 1K7**

**W/O #: 73541**

**INVOICE #: 38152**

**CONTRACT OR  
PURCHASE ORDER # 5510**

**DESCRIPTION: SKID**

**QTY 1**

**P/N # D350748141**

**S/N # B35274**

**CADMIUM PLATE IAW AMS-QQ-P-416 TYPE 2 CLASS 1. MPI IAW  
ASTM-E-1444. BAKE HEAT CHART #8776 & #8884.**

**CERTIFICATE: I certify that the items indicated here on have  
been inspected and tested and conform to all specifications  
and requirements detailed on the contract or purchase order.**

**Approved Inspector:**

*William M. Brzezinski*

